

5.5 NOISE

5.5.1 Introduction

Government Code Section 65302(f) requires the inclusion of a noise element, the primary purpose of which is to serve as a guideline in the development of a noise-compatible land use pattern in the land use element. The State Office of Planning and Research Noise Element Guidelines require that major noise sources be identified and quantified by preparing generalized noise contours for use in analyzing significant noise impacts likely to be created under current and projected conditions. Significant noise sources include traffic on major roadways and highways, railroad operations, airports, representative industrial activities, and fixed noise sources.

Ambient noise, which is the total noise in a given environment, is usually measured with an A-weighted decibel scale (dbA). However, ambient noise varies over time; therefore, other measurements that give an average noise level for a period of time are used. Such measurements include the energy-equivalent noise level (L_{eq}), the day-night average noise level (L_{dn}), and the community noise equivalent level (CNEL).

L_{eq} is an hourly average, while L_{dn} and CNEL are 24-hour weighted averages. The CNEL and L_{dn} are 24-hour average noise level descriptors, which apply penalties to noise which occurs during the evening and nighttime hours. The CNEL and L_{dn} descriptors have been found to provide good correlation to the potential for annoyance from transportation-related noise sources (ie: roadways, airports, railroad operations). However, they do not provide a good correlation to the potential for annoyance from non-transportation or stationary noise sources such as industrial and commercial operations. This is due to the fact that many times stationary noise sources may operate between 8 and 10 hours per day, or will have noise sources such as loading docks, pressure relief valves or alarms which tend to be short duration noise events. When applying an L_{dn} or CNEL criterion, the noise levels associated with these types of short-term operations will be averaged over a 24-hour period, thus underscoring the potential for annoyance.

All three of the aforementioned measurements were used in the noise survey discussed in the Noise Element Background Report. Noise modeling techniques and noise measurements were used to develop generalized L_{dn} /CNEL or L_{eq} noise contours for the major roadways, railroads, and fixed noise sources in the General Plan study area for existing and future conditions.

5.5.2 Findings

The criteria contained in Figure N-IV in the Policies and Objectives Section have been established for determining potential noise conflicts between various land uses and noise sources. The standards are based upon a 24-hour average CNEL/ L_{dn} descriptor. Interior noise level criteria for noise-sensitive uses are also identified in Table N-3. An interior noise level criterion of 45 dB CNEL/ L_{dn} is applied, and is consistent with the interior noise level criterion suggested by the State Office of Noise Control and Office of Planning and Research for interior spaces of noise-sensitive uses affected by transportation noise sources. For purposes of this Noise Element, "noise-sensitive areas and uses" include residential areas, parks, school, churches, hospitals, and long-term care facilities.

Roadways

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for all highway and major roadway segments. The FHWA Model is the analytical method presently favored for traffic noise prediction by most state and local agencies, including Caltrans. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour day and to adjust the traffic volume input data to yield an equivalent hourly traffic volume. Approximately 60 roadway segments were evaluated. Existing and future roadway noise measurement data is provided in Tables N-I and N-II.

TABLE N-I EXISTING (1996) NOISE CONTOUR DATA DISTANCE (FEET) FROM CENTER OF ROADWAY TO L_{dn} CONTOURS			
Segment	Description	Existing	
		60 dB	65 dB
State Route 44:			
1	Airport Rd. to Deschutes Rd.	291	135
2	Deschutes Rd. to Millville Plains Rd.	173	80
3	Millville Plains Rd. to Dersch Rd.	156	72
4	Dersch Rd. to Shingletown	148	68
State Route 89:			
5	Junction Route 299 East to Burney Falls State Park	111	51
6	Doty Rd. to State Route 44	130	60
State Route 299 West:			
7	Trinity County Line Rd. to French Gulch Rd.	100	46
8	Oak Bottom Rd. to Rock Creek Rd.	253	118
9	Rock Creek Rd. to West City Boundary	311	144
State Route 299 East:			
10	Old Oregon Trail to Deschutes Rd.	306	142
11	Deschutes Rd. to Ingot	194	90
12	Ingot to Round Mtn.	208	97
13	Round Mtn. to Montgomery Creek	187	87
14	Tamarack Rd. to Plumas St.	156	72
15	Plumas St. to Pine St.	177	82
16	Pine St. to Junction State Route 89	254	118
17	Junction State Route 89 to Fall River Mills	174	81
18	Fall River Mills to McArthur	211	98
19	McArthur to Pittville Rd.	221	103
20	Pittville Rd. to Totten Rd.	175	81

**TABLE N-1
EXISTING (1996) NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS**

Segment	Description	Existing	
		60 dB	65 dB
Interstate 5:			
21	Castella Interchange to Lakehead	678	315
22	Lakehead to Gilman Rd. Interchange	705	327
23	O'Brien Int. to Bridge Bay Interchange	686	318
24	Bridge Bay Int. to Pine Grove Interchange	577	268
25	Knighton Rd. Int. to Riverside Dr. Interchange	1010	469
26	Riverside Dr. Int. to Deschutes Rd. Interchange	905	420
27	Deschutes Rd. Int. To Gas Point Rd. Interchange	672	312
State Route 273:			
28	Clear Creek Rd. to Latona Rd.	295	137
29	Latona Rd. to Ox Yoke St.	317	147
30	Ox Yoke St. to Alexander Ave.	317	147
Gas Point Road:			
31	West of Happy Valley Rd.	143	66
32	Happy Valley Rd. to Interstate 5	40	18
Dersch Road:			
33	East of Deschutes Rd. to State Route 44	101	47
Deschutes Road:			
34	Dersch Rd. to State Route 44	176	82
35	State Route 44 to State Route 299W	134	62
Canyon Road:			
36	West of State Route 273 to Happy Valley Rd.	186	87
Happy Valley Road:			
37	Happy Valley Rd. to Gas Point Rd.	42	19
Placer Road:			
38	West City Boundary to Platina Rd.	99	46
Lake Boulevard:			
39	North City Boundary to Ashby Rd.	272	126
40	Ashby Rd. to State Route 151	107	50
Rhonda Road:			
41	Between Deschutes Rd. and Gas Point Rd.	21	10
Olinda Road:			
42	State Route 273 to Happy Valley Rd.	73	34
Clear Creek Road:			

**TABLE N-I
EXISTING (1996) NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS**

Segment	Description	Existing	
		60 dB	65 dB
43	State Route 273 to Placer Rd.	126	59
Balls Ferry Road:			
44	Entire length	69	32
Keswick Dam Road:			
45	Iron Mountain Rd. to Lake Blvd.	59	27
Quartz Hill Road:			
46	Keswick Dam Rd. to Snow Ln.	25	12
Oasis Road:			
47	Interstate 5 to Lake Boulevard	53	25
48	Interstate 5 (City of Redding) to Old Oregon Trail	109	50
Bear Mountain Road:			
49	Entire road	82	38
Old Oregon Trail Road:			
50	Bear Mtn Rd. to Akrich Rd.	131	61
51	Oasis Rd. to State Route 299 East	109	51
52	Old Alturas Rd. to State Route 44	81	38
Old Alturas Road:			
53	Old Oregon Trail to Boyle Rd.	82	38
Airport Road:			
54	South City Boundary to Meadowview Rd.	228	106
55	Meadow View Rd. to North St.	202	94
Churn Creek Road:			
56	Knighton Rd. To Meadow View Rd.	121	56
Dry Creek Road:			
57	State Route 299 to Bear Mountain Rd.	62	29
Oak Run Road:			
58	Community of Oak Run to Old State Route 44	86	40
Whitmore Road:			
59	Fern Rd. to Millville Plains (State Route 44)	51	24
Platina Road:			
60	Gas Point Rd. to State Route 36	46	21
Ash Creek Road:			
61	Entire Road	34	16

**TABLE N-II
FUTURE (YEAR 2020) NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS**

Segment	Description	Future	
		60 dB	65 dB
State Route 44:			
1	Airport Rd. to Deschutes Rd.	374	174
2	Deschutes Rd. to Millville Plains Rd.	215	100
3	Millville Plains Rd. to Dersch Rd.	181	84
4	Dersch Rd. to Shingletown	173	81
State Route 89:			
5	Junction Route 299E to Burney Falls State Park	144	67
6	Doty Rd. to State Route 44	186	86
State Route 299 West:			
7	Trinity County Line Rd. to French Gulch Rd.	165	46
8	Oak Bottom Rd. to Rock Creek Rd.	371	118
9	Rock Creek Rd. to West City Boundary	388	180
State Route 299 East:			
10	Old Oregon Trail to Deschutes Rd.	414	192
11	Deschutes Rd. to Ingot	255	118
12	Ingot to Round Mtn.	275	128
13	Round Mtn. to Montgomery Creek	256	119
14	Tamarack Rd. to Plumas St.	211	98
15	Plumas St. to Pine St.	208	96
16	Pine St. to Junction State Route 89	299	139
17	Junction State Route 89 to Fall River Mills	218	101
18	Fall River Mills to McArthur	263	122
19	McArthur to Pittville Rd.	283	131
20	Pittville Rd. to Totten Rd.	236	110
Interstate 5:			
21	Castella Interchange to Lakehead	943	438
22	Lakehead to Gilman Rd. Interchange	969	450
23	O'Brien Interchange to Bridge Bay Interchange	932	433
24	Bridge Bay Interchange to Pine Grove Interchange	762	354
25	Knighton Rd. Interchange to Riverside Dr Interchange	1341	623
26	Riverside Dr. Interchange to Deschutes Rd. Interchange	1228	570
27	Deschutes Rd. Interchange to Gas Point Rd. Interchange	996	448
State Route 273:			

**TABLE N-II
FUTURE (YEAR 2020) NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS**

Segment	Description	Future	
		60 dB	65 dB
28	Clear Creek Rd. to Latona Rd.	375	174
29	Latona Rd. to Ox Yoke St.	402	187
30	Ox Yoke St. to Alexander Ave.	402	186
Gas Point Road:			
31	West of Happy Valley Rd.	174	81
32	Happy Valley Rd. to Interstate 5	51	24
Dersch Road:			
33	East of Deschutes Rd. to State Route 44	152	70
Deschutes Road:			
34	Dersch Rd. to State Route 44	237	110
35	State Route 44 to State Route 299W	198	92
Canyon Road:			
36	West of State Route 273 to Happy Valley Rd.	224	104
Happy Valley Road:			
37	Happy Valley Rd. to Gas Point Rd.	48	22
Placer Road:			
38	West City Boundary to Platina Rd.	100	46
Lake Boulevard:			
39	North City Boundary to Ashby Rd.	309	143
40	Ashby Rd. to State Route 151	114	53
Rhonda Road:			
41	Between Deschutes Rd. and Gas Point Rd.	33	15
Olinda Road:			
42	State Route 273 to Happy Valley Rd.	97	45
Clear Creek Road:			
43	State Route 273 to Placer Rd.	160	74
Balls Ferry Road:			
44	Entire road	73	34
Keswick Dam Road:			
45	Iron Mountain Rd. to Lake Blvd.	172	80
Quartz Hill Road:			
46	Keswick Dam Rd. to Snow Ln.	132	61
Oasis Road:			

**TABLE N-II
FUTURE (YEAR 2020) NOISE CONTOUR DATA
DISTANCE (FEET) FROM CENTER OF ROADWAY
TO L_{dn} CONTOURS**

Segment	Description	Future	
		60 dB	65 dB
47	Interstate 5 to Lake Boulevard	119	55
48	Interstate 5 (City of Redding) to Old Oregon Trail	221	103
Bear Mountain Road:			
49	Entire road	100	47
Old Oregon Trail Road:			
50	Bear Mtn Rd. to Akrich Rd.	189	88
51	Oasis Rd. to State Route 299 East	225	104
52	Old Alturas Rd. to State Route 44	200	93
Old Alturas Road:			
53	Old Oregon Trail to Boyle Rd.	110	51
Airport Road:			
54	South City Boundary to Meadowview Rd.	437	203
55	Meadowview Rd. to North St.	315	146
Churn Creek Road:			
56	Knighton Rd. To Meadow View Rd.	141	66
Dry Creek Road:			
57	State Route 299 to Bear Mountain Rd.	67	31
Oak Run Road:			
58	Community of Oak Run to Old State Route 44	117	54
Whitmore Road:			
59	Fern Rd. to Millville Plains (State Route 44)	61	28
Platina Road:			
60	Gas Point Rd. to State Route 36	52	24
Ash Creek Road:			
61	Entire road	39	18

Railroads

Shasta County is served by two railroad lines: The Union Pacific single track main line which parallels Interstate 5 and the McCloud Railway Company is a single track short line running from McCloud to Burney. Railroad activity by the McCloud Railway is limited and therefore noise measurements were not conducted. Principal railroad activity in the County study area generally occurs along the Union Pacific Railroad (UPRR) main line track which travels north/south through the study area. Noise measurements were conducted at two sites within the study area. The measurements were conducted to determine the contribution of UPRR railroad operations to the area noise environment.

The purpose of the noise level measurements was to determine the typical sound exposure levels (SEL) for railroad line operations in the County, accounting for the effects of travel speed, warning horns, and other factors which may affect noise generation. The data thus derived could then be compared to other file data for railroad operational noise levels to better describe the railroad noise environment as it affects the area noise environment, and an annual average L_{dn} could be calculated. Based upon the noise level measurements, the average SEL at a reference distance of 50 feet for freight train operations along the UPRR railroad track ranged between 100.4 dB at the monitoring site south of Bonnyview Road, to 107.3 dB at the monitoring site in Cottonwood. Table N-III illustrates the approximate distance to the 60 dB and 65 dB L_{dn} noise contour. This data should be used as a guide for determining the approximate distance to the 60 dB and 65 dB L_{dn} contours at other locations having similar characteristics. However, preparation of site-specific acoustical analysis is highly recommended for projects likely to fall within projected rail contours. The methods and calculations for the noise contours are described in the Noise Element Background Report.

TABLE N-III APPROXIMATE DISTANCE TO UPRR RAILROAD NOISE CONTOURS							
L_{dn} , Based upon distance from RR tracks				Distance to L_{dn} Contour (feet)			
At 50'		At 100'		60 dB		65 dB	
Existing	Future	Existing	Future	Existing	Future	Existing	Future
South of Bonnyview Road							
69.5 dB	70.8 dB	65.0 dB	66.3 dB	215	262	100	122
Cottonwood							
76.0 dB	77.3 dB	71.5 dB	72.8 dB	580	711	269	330

Aircraft Noise Levels

Noise levels due to aircraft operations have been identified as a major noise source within the County. There are three existing airports within the planning area: Redding Municipal Airport, Shingletown Airport, and Falls River Mills Airport.

Redding Municipal Airport

The Redding Municipal Airport is a commercial service primary airport, owned by the City of Redding. The airport has two runways with headings 16/34 and 12/30. There are currently approximately 170 based aircraft at the Redding Municipal Airport. In 2003, there were approximately 81,000 total aircraft operations. Existing airline passenger emplanements are estimated at approximately 65,000 per year. The 1993/94 noise impacts for the Redding Municipal Airport were identified in the document entitled Redding Municipal Airport Master Plan Report Update, August 1995. Noise contours shown in the Noise Element Background Report identify that the 65 dB CNEL contour is confined primarily to the airport property. The 60 dB CNEL contour extends outside of the property, but does not encroach on existing residential uses.

According to the Airport Master Plan, aviation growth at the Redding Municipal Airport will impact the area surrounding the airport. The total number of aircraft operations are estimated to increase to 162,400 by the year 2015.

Shingletown Airport

Shingletown Airport is a “less than Basic Utility Stage I facility,” leased by Shasta County. The airport has one runway with the heading 1/19. There is currently no based aircraft at the Shingletown Airport.

In 2003, there were zero aircraft operations. At present, due to trees in the runway protection zone, the operating permit has been suspended by the state. The County is working with the landowners to remove the trees in 2004. The 1995 Shingletown Airport noise impacts were identified in the Shasta County Airports Master Plan 1990-2010 Report, prepared by Wadell Engineering Corporation in 1990. The existing CNEL contours for the operations at the Shingletown Airport were not provided.

Aviation growth at the Shingletown Airport can have a significant impact on the area. It has been projected that the number of based aircraft will increase from 2 to 16 during the planning period. The total aircraft operations are projected to increase to 13,520 by the year 2010. Future (2010) CNEL contours for the operations at the Shingletown Airport are provided in the Noise Element Background Report. Based upon the noise contours, the 65 dB CNEL contour is confined to lands designated Public Facility and Industrial. The 60 dB CNEL contour encompasses lands designated Public Facility, Industrial, Mixed Use, and Rural Residential A.

Fall River Mills Airport

Fall River Mills Airport is a “Utility Stage I facility,” owned by Shasta County. The airport has one runway with the heading 2/20. There are currently 14 based aircraft at the Fall River Mills Airport. In 2001, there were approximately 6,000 total aircraft operations. The 2001 noise impacts for Fall River Mills Airport were provided by Mead and Hunt Company in the Environmental Assessment (EA) for the Fall River Mills Airport Layout Plan dated April 2003. The existing CNEL contours for the operations at the Fall River Mills Airport indicate that the 65 CNEL contour is contained entirely within the existing airport boundary.

Aviation growth at the Fall River Mills Airport can also impact the area surrounding the airport. It has been projected that the number of based aircraft will increase from 14 to 21. The total number of aircraft operations are expected to increase to 15,000 by the year 2021. The future (2021) CNEL contours for the operations at the Fall River Mills Airport are provided in Section 4, Environmental Setting and Consequences of the Environmental Assessment (EA). Based upon the noise contours, the 65 dB CNEL contour is confined to lands designated Public Facility and Agriculture. The 60 dB CNEL contour encompasses Public Facility, Agriculture, and Urban Residential lands.

Fixed Noise Sources

The production of stationary noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational, and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which may be annoying to individuals who live in the vicinity. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day, and existing ambient noise levels.

From a land use planning perspective, fixed-source noise control issues focus upon two goals: to prevent the introduction of new noise-producing uses in noise-sensitive areas, and to prevent encroachment of noise-sensitive uses upon existing noise-producing facilities. The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in proximity to noise-producing facilities include mitigation measures to ensure compliance with noise performance standards.

Industrial, light industrial, commercial, and public service facilities which have the potential for producing objectionable noise levels at nearby noise-sensitive uses are dispersed throughout the County. Fixed noise sources which are typically of concern include, but are not limited to, the following:

HVAC Systems	Cooling Towers/Evaporative Condensers	Fans
Pump Stations	Lift Stations	Boilers
Emergency Generators	Generators	Air Compressors
Steam Valves	Steam Turbines	Heavy Equipment
Conveyor Systems	Transformers	Grinders
Pile Drivers	Blowers	Outdoor Speakers
Drill Rigs	Gas or Diesel Motors	Welders
Cutting Equipment		

The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities including lumber mills, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields. Shasta County contains a variety of existing industrial sites which influence the surrounding noise environment. Noise contours have been mapped for the primary fixed noise sources which are on file in the Department of Resource Management, Planning Division. A noise level of 50 dB was selected as the base criteria for examining fixed noise sources. The 50 dB contour reflects an interior residential environment of 35 dB which is comfortable for sleeping based on a 15 dB loss which is the typical noise reduction experienced inside a residence with the windows partially open. The typical hourly average noise level due to operations for identified fixed noise sources include:

Wheelabrator Energy Company is located at 20811 Industry Road. Typical hourly average noise level due to operations is approximately 57 dB L_{eq} at a distance of 750 feet from the plant. The distance to the 50 dB L_{eq} noise level contour is estimated to be 1,700 feet from the main plant.

Sierra Pacific Industries is located at 19758 Riverside Avenue. The location for the 50 dB L_{eq} noise level contour is estimated to be 500 feet from the property lines.

Siller Brothers Inc. is a general lumber manufacturing and stud manufacturing company located at 2457 Latona Road. A second facility is located across the road at 19214 Latona Road. The south side generates an average noise level of 62 dB L_{eq} at a distance of 200 feet. The measured noise level for the facility on the north side of the road was 64 dB L_{eq} at a distance of 100 feet. The distances to the 50 dB L_{eq} noise level contours are 800 feet for the main plant on the south side of Latona Road, and 500 feet for the facility located on the north side of Latona Road.

There are numerous commercial, light industrial, manufacturing, and heavy industrial facilities adjacent to Highway 273 and the railroad. However, due to the fact that the dominant noise source in the area is the traffic on Highway 273, activities at these sites are for the most part not a significant noise source.

Siskiyou Forest Products is located along the east side of Highway 273. Typical steady state noise levels are approximately 55 dB at a distance of 150 feet. Therefore, the distance to the 50 dB L_{eq} noise level contour is approximately 275 feet from the facility.

The area referred to as the Clear Creek Road Industrial Area is located west of State Route 273 in the southwest portion of Redding. The area contains numerous industrial type uses. Clear Creek Road traverses through incorporated areas of Redding, and unincorporated portions of Shasta County. Uses along Clear Creek Road include Schmitt Trucking, Clear Creek Construction, West Side Aggregate, J.F. Shea Aggregate, Sunrise Landscape, Redding Power, Pac West Helicopters and Factory Cast Concrete. The uses which are located in Shasta County include Pac West Helicopters and Factory Cast Concrete. Residences in the unincorporated area along Bohn Boulevard are located on a bluff which overlooks many of the industrial type uses along Clear Creek Road. Continuous hourly noise measurements at two locations along Bohn Boulevard were conducted for a 24-hour period to determine noise levels associated with operations along Clear Creek Road. J.F. Shea Aggregate dominated the noise environment. Crushers, back-up bells on mobile equipment, and heavy trucks were the dominant noise sources. Results of the noise level measurements indicated that hourly noise levels due to operations at the quarries along Clear Creek Road were 45 dB L_{eq} at the closest residences along Bohn Boulevard. Therefore, it is not anticipated that operations along Clear Creek Drive exceed an hourly noise level of 50 dB L_{eq} to the nearest residence.

Factory Cast Concrete is located at 16575 Clear Creek Road. Noise level measurements at the site indicated that at a distance of 300 feet from the plant the hourly L_{eq} was 40 dB.

Lehigh Southwest Cement Company is located at 15390 Wonderland Boulevard in Mountain Gate. The plant produced a noise level of 54.5 dB L_{eq} at a distance of approximately 500 feet from the main plant. The noise source associated with the operation is generally steady-state in nature. The distance to the hourly 50 dB L_{eq} noise level contour is predicted to be approximately 850 feet from the main plant.

The Lehigh Southwest Cement Company also harvests limestone for the cement operation across Interstate 5 to the east from the cement plant. Currently, all operations occur approximately one mile from the nearest residence. Due to the considerable distance from operations to residences, no noise measurements of the operations were conducted. Discussions with company officials indicate that some complaints have been received from residences due to blasting. Generally, the complaints are not due to perceived loud noise, but from some window rattling and the very abrupt low frequency of noise which is inherent to blasting.

Mountain Gate Limestone Quarry and Fawndale Rock and Asphalt quarries are located east of Interstate 5 in Mountain Gate. These quarries are located next to each other and have similar operations. Noise level measurements of on-site operations were conducted at the Mountain Gate Quarry. Measured noise levels at a distance of approximately 400 feet from the crushing operations was 72.1 dB L_{eq} . Based upon the noise level measurement data, the distance to the worst-case 50 dB hourly L_{eq} noise level contour is approximately 5,000 feet. However, local topography shields the majority of the on-site noise sources, and it is expected that the on-site 50 dB hourly L_{eq} noise level contour is generally confined to the site. The Noise Element Background Report shows the approximate location of the 50 dB hourly L_{eq} noise level contour, while accounting for shielding from existing topography. Existing residences are located along the access road to the quarry site. Based upon typical noise levels associated with heavy ore trucks, it is estimated that the hourly average noise level along the access road is approximately 53 dB L_{eq} at a distance of 100 feet.

Keller Lumber is located at 10910 Iron Mountain Road. Noise level measurements conducted for the operations in 1998 indicated that the overall noise level is 59 dB L_{eq} at a distance of 150 feet. The distance to the 50 dB L_{eq} noise level contour is approximately 425 feet from the plant.

Sierra Pacific Industries is a wood processing and lumber manufacturing facility which is located at 36336 Highway 299 East, and is located east of the community of Burney. The noise measurement survey indicates that the operations produce a typical hourly noise level of approximately 55 dB L_{eq} at a distance of 800 feet from the main plant. The location of the 50 dB L_{eq} noise level contour is approximately 1,400 feet from the main plant.

Burney Mountain Power is a wood waste cogeneration facility which is located at Highway 299 East and Energy Lane, west of the community of Burney. The results of the noise measurements indicated that the facility produces a steady-state noise level of approximately 64 dB L_{eq} at a distance of 200 feet from the main plant. The calculated distance to the 50 dB L_{eq} noise level contour is approximately 1,000 feet from the main plant.

Fiberboard Mill industrial site is located north and west of the communities of Burney and Johnson Park along Highway 89. This site operated as a lumber mill for over 40 years. The site is currently used as a construction contractor's yard. Based on the size of the site, it is anticipated that more intensive industrial use of the site similar to the historic use may occur in the future.

Cassel Industrial Park is located along Cassel Road north and east of the communities of Burney and Johnson Park. Uses at the Industrial Park include Boyd Trucking Company, retail lumber, machine shops, and Enloe Well Drilling. In addition, the Packway Materials Inc. quarry and batch plant is located adjacent to the Industrial Park. Based upon observations at the site, the uses at the Industrial Park are generally quiet, only traffic to and from the site generate noise. The Packway Materials Inc. is a noise-producing use, and major noise sources associated with the operation include a small cone crusher, conveyors for sorting materials, some on-site equipment, and a concrete batch plant. Noise level measurements of the operations were conducted on June 25, 1998. Noise level measurements were conducted from this Road and at the adjacent Crystal Mobile Home Park. The noise level measurements indicate that hourly noise levels are approximately 57 dB L_{eq} at a distance of 300 feet from the plant. The distance to the 50 dB hourly L_{eq} noise level contour is 700 feet from the batch plant.

As the County updates the GIS mapping data base, the traffic, airports, and railroad noise contour information contained within the Background Report for the Shasta County Noise Element shall be included as a part of the mapping data base. Noise contours for transportation and fixed-noise sources shall be periodically updated and any subsequent revisions of the data should be incorporated into the General Plan and adopted for noise control planning purposes, as appropriate.

5.5.3 Objectives

- N-1 To protect County residents from the harmful and annoying effects of exposure to excessive noise.
- N-2 To protect the economic base of the County by preventing incompatible land uses from encroaching upon existing or programmed land uses likely to create significant noise impacts.
- N-3 To encourage the application of state-of-the-art land use planning methodologies in the area of managing and minimizing potential noise conflicts.

5.5.4 Policies

- N-a New noise-sensitive uses shall not be allowed in areas where the noise level created by existing non-transportation noise sources will exceed the noise level standards of Table N–IV as measured immediately within the property line or within a designated outdoor activity area (at the discretion of the Planning Director) of the proposed project, unless effective noise mitigation measures will be incorporated into the project design to achieve compliance with the standards specified in Table N–IV.
- N-b Noise likely to be created by a proposed non-transportation land use shall be mitigated so as not to exceed the noise level standards of Table N–IV as measured immediately within the property line of adjacent lands designated as noise-sensitive. Noise generated from existing or proposed agricultural operations conducted in accordance with generally accepted agricultural industry standards and practices is not required to be mitigated.
- N-c Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table N–IV upon existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that appropriate noise mitigation may be included in the project design. The requirements for the content of an acoustical analysis are given by Table N-V.
- N-d The feasibility of proposed projects with respect to existing and future transportation noise levels shall be evaluated by comparison to Figure N-1 and Table N–VI.
- N-e New development of noise-sensitive land uses will not be permitted in areas exposed to existing or projected noise levels from transportation-related sources which exceed the levels specified in Table N–VI unless the project design includes effective mitigation measures to reduce both exterior and interior noise levels to satisfy the requirements in Table N–VI.
- N-f Noise created by new transportation sources shall be mitigated to satisfy the levels specified in Table N–VI at outdoor activity areas and/or interior spaces of existing noise-sensitive land uses. Transportation noise shall be compared with existing and projected noise levels shown in Tables N-I and N-II.
- N-g Existing noise-sensitive uses may be exposed to increased noise levels due to future roadway improvement projects as a result of increased traffic capacity and volumes and increases in travel speeds. In these instances, it may not be practical to reduce increased traffic noise levels consistent with those contained in Table N-VI. Therefore, as an alternative, the following criteria may be used as a test of significance for increases in the ambient outdoor activity areas of the noise level of noise-sensitive uses created as a result of a new roadway improvement project:
- Where existing traffic noise levels are less than 60 dB L_{dn} , a +5 dB L_{dn} increase will be considered significant; and
 - Where existing traffic noise levels range between 60 and 65 dB L_{dn} , a +3 dB L_{dn} increase will be considered significant; and
 - Where existing traffic noise levels are greater than 65 dB L_{dn} , a + 1.5 dB L_{dn} increase will be considered significant.

N-h Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table N-VI or the performance standards of Table N-IV, an acoustical analysis shall be required as part of the environmental review process so that effective noise mitigation measures may be included in the project design.

N-i Where noise mitigation measures are required to achieve the standards of Tables N-IV and N-VI, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving compliance with the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

Note: Existing dwellings and new single-family dwellings are not subject to County review with respect to satisfaction of the standards of the Noise Element. As a consequence, such dwellings may be constructed in areas where noise levels exceed the standards of the Noise Element. It is not the responsibility of the County to ensure that such dwellings meet the noise standards of the Noise Element, or the noise standards imposed by lending agencies such as HUD, FHA and Cal Vet. If homes are located and constructed in accordance with the Noise Element, it is expected that the resulting exterior and interior noise levels will conform to the HUD/FHA/Cal Vet noise standards.

N-j Encourage railroad officials to install noise-mitigation features on trains, equipment, and at fixed-based facilities whenever possible, and instruct railroad engineers to limit their use of air horns to reduce rail-related noise impacts on cities, towns, and rural community centers.

N-k All County airports lacking adopted noise level contours consistent with the General Plan forecast year of 2025 should update their respective Master Plans or Comprehensive Land Use Plans (CLUP) to reflect aircraft operation noise levels for existing and future operations.

N-l The use of site planning and building materials/design as primary methods of noise attenuation is encouraged. Recommended techniques include, but are not limited to, such items as:

Site Planning

- Use of building setbacks and dedication of noise easements to increase the distance between the noise source and the receiver.
- Locating uses and orienting buildings that are compatible with higher noise levels adjacent to noise-generators or in clusters as a means to shield more noise-sensitive areas and uses.
- Using noise-tolerant structures, such as garages or carports, to shield noise-sensitive areas.
- Clustering office, commercial, or multiple-family residential structures to reduce interior open-space noise levels.
- Locate automobile and truck access to commercial or industrial land uses abutting residential parcels at the maximum practical distance from the residential parcels.
- Avoid the siting of commercial and industrial loading and shipping facilities adjacent to residential parcels whenever practicable.

- Parking areas for commercial and industrial uses should be set back from adjacent residential uses to the maximum extent feasible, or buffered and shielded by walls, fences, berms, and/or landscaping techniques.

Building Materials/Design

Using dense building materials and tight-fitting doors.

Employing multi-glazed and multi-pane windows.

Placing unopenable windows on the side of the structure facing a major roadway and entry doors on the side of the building facing away from the major roadway.

Avoiding placing balconies and patio areas facing major transportation routes.

**TABLE N-IV
NOISE LEVEL PERFORMANCE STANDARDS FOR NEW PROJECTS
AFFECTED BY OR INCLUDING NON-TRANSPORTATION SOURCES**

Noise Level Descriptor	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L_{eq} , dB	55	50

The noise levels specified above shall be lowered by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

The County can impose noise level standards which are more restrictive than those specified above based upon determination of existing low ambient noise levels.

In rural areas where large lots exist, the exterior noise level standard shall be applied at a point 100' away from the residence.

Industrial, light industrial, commercial, and public service facilities which have the potential for producing objectionable noise levels at nearby noise-sensitive uses are dispersed throughout the County. Fixed-noise sources which are typically of concern include, but are not limited to, the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Emergency Generators	Boilers
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers

The types of uses which may typically produce the noise sources described above include, but are not limited to: industrial facilities including lumber mills, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

Note: For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations, and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, etc.

**TABLE N-V
REQUIREMENTS FOR AN ACOUSTICAL ANALYSIS**

An acoustical analysis prepared pursuant to the Noise Element shall:

- A. Be the financial responsibility of the applicant.
- B. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.
- C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.
- D. Estimate existing and projected cumulative (20 years) noise levels in terms of L_{dn} or CNEL and/or the standards of Table I, and compare those levels to the adopted policies of the Noise Element.
- E. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element, giving preference to proper site planning and design over mitigation measures which require the construction of noise barriers or structural modifications to buildings which contain noise-sensitive land uses.
- F. Estimate noise exposure after the prescribed mitigation measures have been implemented.
- G. Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

**TABLE N-VI
MAXIMUM ALLOWABLE NOISE EXPOSURE
TRANSPORTATION NOISE SOURCES**

Land Use	Outdoor Activity Areas ¹ L _{dn} /CNEL, dB	Interior Spaces	
		L _{dn} /CNEL,dB	L _{eq} , dB ²
Residential	60 ³	45	--
Transient Lodging	60 ⁴	45	--
Hospitals, Nursing Homes	60 ³	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60 ³	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

¹ Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.

² As determined for a typical worst-case hour during periods of use.

³ Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, exterior noise levels of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

⁴ In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.

N-m The County should adopt noise control guidelines to assist staff and project applicants in determining the appropriate methods for reducing transportation and non-transportation generated noise.

N-n The State Noise Insulation Standards (California Code of Regulations, Title 24) and Chapter 35 of the Uniform Building Code (UBC) shall be enforced.

N-o As the County updates the GIS mapping data base, the traffic, airport, and railroad noise contour information contained within the Background Report for the Noise Element shall be included as a part of the mapping data base. Noise contours for transportation and fixed-noise sources should be periodically updated and any subsequent revisions of the data shall be incorporated into the General Plan and adopted for noise control planning purposes, as appropriate.

**FIGURE N-1
TRANSPORTATION NOISE RELATED
LAND USE COMPATIBILITY GUIDELINES FOR DEVELOPMENT**

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE						
	L _{dn} OR CNEL, dB						
	55	60	65	70	75	80	
Residential, Theaters, Music Halls, Meeting Halls, Churches, & Auditoriums	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■
Transient Lodging - Motels, Hotels, & RV Parks	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■
Schools, Libraries, Museums, Nursing Homes, & Child Care	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■
Playgrounds, Neighborhood Parks, & Amphitheaters	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■
Office Buildings, Business, Commercial, & Professional	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■
Industrial, Manufacturing, Agriculture, & Utilities	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■
Golf Courses, Outdoor Spectator Sports, & Riding Stables	G.A.	■	■	■	■	■	■
	C.A.	■	■	■	■	■	■
	G.U.	■	■	■	■	■	■

INTERPRETATION

G.A. = GENERALLY ACCEPTABLE

Specified land use is satisfactory. No noise mitigation measures are required.

C.A. = CONDITIONALLY ACCEPTABLE

Use should be permitted only after careful study and inclusion of protective measures as needed to satisfy the policies of the Noise Element.

G.U. = GENERALLY UNACCEPTABLE

Development is usually not feasible in accordance with the goals of the Noise Element.

Source: Brown-Buntin Associates Inc, 1998

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